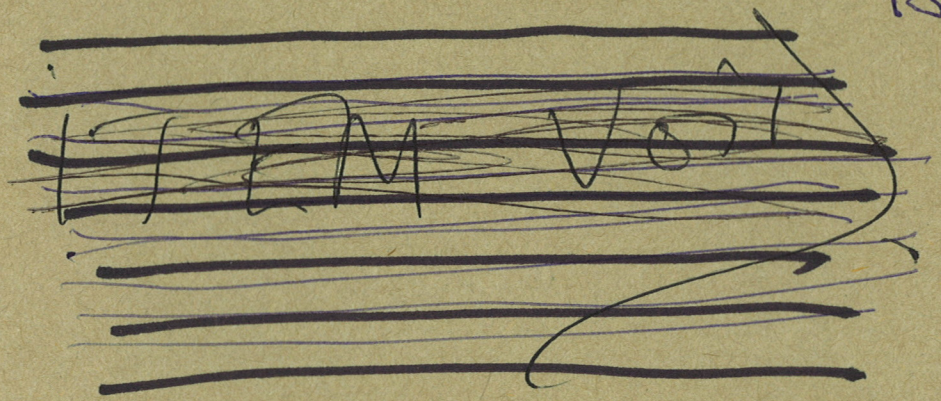
On Her Majesty's Service

Antonia Bidermann -
Notes on a visit
to Waltham Abbey
1838



Notes on Waltham Abbey Works
1838

Antoine Bidermann, Lammot du Pont Papers.

Notes on Waltham Abbey

In the Coal House: The wood to be charred is placed in sheet-iron cylinders which are introduced into cast-iron ones built in the furnace in an horisontal position. These cylinders fit each other as much as possible so as to let the inside one go in & out without difficulty. The inside cylinder has two pipes, at the far end, going out of the cast-iron one through corresponding holes. One of these is for the tar, the other for the gases. The cast-iron cylinder is slightly inclined from the front to the back of the furnace in order to run out the tar that might penetrate between the two. After the introduction of the inside cylinder, the outside one is closed with a door hung on hinges, fitting hermetically, & fastened with a strong bar. The operation terminated, the inside cylinder is taken out, put with its contents in a close recipient (Stouffoir) and a new one introduced in its place. The principle is to have a slow fire in the beginning, unless however the furnace is cold in which case they do not fear to make a brisk fire, notwithstanding which the first operation takes 7 1/2 hours. The furnace being warm, the second charring goes quicker and they can renew six times in 24 hours. They have no rule to determine when the coal is sufficiently done. They char it more than is done at Esquerde. It is more tender than the one made at the latter place, although they fear not to have it hard. They say that it is more tender when less charred. I should think there is a medium.

The Saltpetre is refined in cristals and then fused. They pulverise it under rollers lighter than those used for the powder. They use, for this purpose, old rollers which have been dressed until they become too light for powder. The Sulphur & Charcoal are also pulverised, each separately in the same way. Each material is then bolted separately through a wire bolter. The composition, after being weighed, is passed again through a rather coarse wire sieve and* mixed by machine; after it is put in the rolling mill where it is watered by hand, partly before the mill is started, partly while it runs. The rollers are stone: some Welsh, some Irish and some from the Rhine (Mr. Curtis has some cast-iron rollers which he prefers to any others, and he pretends to have been the first to use them). These stone rollers are from 5 ft-9 to 6 ft-3 in diameter, about 18 in-thick and straight on the face. Their weight is about 5 tons. They run on different tracks. The platform is 7 ft-3 in diameter inside of the curb. The cheese is 2 ft-3 in diameter. Their scrapers which they call "ploughs" are of a particular shape and fixed with wedges so as to be set lower down as the block wears out. The rollers keeping very clean and the curb being more inclined (evase) than with us, they have no need of scrapers on the rollers or of curtains. The platform is either stone or marble and keeps a fine polish. Each water wheel turns two pairs of rollers. The speed is eight turns pr-minute and, in order not to depend altogether on the workman, there is a "governor" under the control of the machinist.

The rolling mill cakes are broken with malls and then carried under the presses. These resemble the cloth or paper presses, with the difference that the screw is brass. Underneath is a kind of wooden

trough about 3 ft. long 1 ft 6 wide & 2 ft deep. They spread down* 4" rolling mill powder on which they put a thin copper lay board, then powder again & so on until the trough is full, after which they lower a wooden saddle fitting in the trough on which, by means of lever or capstan, they apply a pressure of 113 tons to the square foot. They say this operation is necessary to give the powder the required density. The cakes so made are from 1 1/2 to 2 in thick and, although they are hard, the original rolling mill cakes of which they are composed, shows very plainly. These cakes are broken again with malls and ground in the "corning mill."

The Corning mill is on the principle of what we called the "Jenny Gibbs." It consists of a suspended frame containing a number of sieves moved by a crank of 6 or 6 1/2 in with a speed of 60 to 63 PR minute. The bottoms of the sieves are made of a punched sheet of copper. The dust made in graining is worked one hour in the rolling mill and afterwards treated like other rolling mill powder.

The glazing is performed in barrels of a smaller diameter than ours, nearly as long. The operation lasts 3 to 4 hours during which they turn at an uniform speed of 32 pr minute.

The drying is done in two ways, neither of which is very satisfactory: The old one called the "Gloom Chamber" is much like our old drying houses, with the difference that the stove is made red hot and is covered over with a kind of case to keep the powder from it. The ceiling is full 12 ft high, therefore the lower boxes can not get warm. Their boxes are very small, containing from 15 to 20 each. The new process differs from the old one, only in as much as the house is heated by steam brought in through a spiral tube.

The cannon powder is proved on the mortar eprouvette. They have besides Hutton's eprouvette which consists of a pendulum swivel giving only the recoil. They have also an eprouvette invented by their machinist. It is a small cast-iron target on a railway with a hand showing how far it has been pushed by a ball shot from a rifle barrel.

Notes on Waltham
Abbey Powder Works by
Anth Biderman Esqr
1838

* Touille.

* I have evidently made an error on the quantity of powder between the layboards, which is much larger. I should think also that the pressure is not now as great as here stated.

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June 24, 1963

Dr. C.H. Johnson, CBE
Explosives Research & Development
Powdermill Lane
Waltham Abbey, Essex
England

Dear Dr. Johnson:

Thank you for your letter of June 18 and for the enclosures pertaining to Lammot du Pont's visit in 1858. We are pleased to have these items, but we recognize, as you inform us, that most likely the War Office records would have to be examined at the Public Record Office in a thorough search. We shall hold this in abeyance.

I find in our collection of du Pont papers some notes on Waltham Abbey made as early as 1838 by Antoine Bidermann, an uncle of Lammot du Pont's, who made an extended tour of the Continent and the British Isles in 1837-1838. He was one of the partners in the E.I. du Pont de Nemours & Company. A copy of his comments is enclosed which I trust you will find of interest. After I return from vacation in mid-July I shall locate his nephew's observations of 1858 and send them along.

Thank you for your generous assistance.

Sincerely yours,

N.B. Wilkinson

Norman B. Wilkinson
Research Associate

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Enc.